CLAIMS

What is claimed is:

1. An oil-sorbing filter element including a first stage, the first stage being formed of a first medium comprising a consolidated, permeable mass of a first oleophilic polymeric material.

2. The filter element of claim 1 wherein the consolidated mass of the first medium has a density of between about 0.2-0.8 g/cm^3.

3. The filter element of claim 1 wherein the first oleophilic polymeric material is oil-absorbing.

4. The filter element of claim 3 wherein the oil-absorbing first oleophilic polymeric material is a thermoplastic elastomer.

5. The filter element of claim 4 wherein the thermoplastic elastomer of first oleophilic polymeric material is a styrenic mid-block copolymer.

6. The filter element of claim 5 wherein the styrenic mid-block copolymer of the first oleophilic polymeric material is selected from the group consisting of styrene-ethylene/butylene-styrene (SEBS), styrene-ethylene/propylene-styrene (SEPS), styrene-butadiene-styrene (SBS), styrene-isoprene-styrene (SIS), and combinations thereof.

7. The filter element of claim 3 wherein the oil-absorbing first oleophilic polymeric material is a copolymer of styrene and one or more of pentadiene, cyclopentadiene, butadiene, butylene, propylene, ethylene, and isoprene.

8. The filter element of claim 1 wherein the first oleophilic polymeric material is oil-adsorbing.

9. The filter element of claim 8 wherein the oil-adsorbing first oleophilic polymeric material is a polyolefin.

10. The filter element of claim 1 wherein the first medium further comprises an oil-sorbing filler dispersed in the consolidated mass of the first oleophilic polymeric material.

11. The filter element of claim 10 wherein the filler is an activated carbon.

12. The filter element of claim 1 wherein the first stage is formed into a generally cylindrical shape.

13. The filter element of claim 12 wherein the cylindrical shape of the first stage is generally annular.

14. The filter element of claim 1 further including a second stage adjoining the first stage.

15. The filter element of claim 14 wherein the second stage is formed of a second medium comprising a fill of a second oleophilic polymeric material.

16. The filter element of claim 15 wherein the second oleophilic polymeric material is oil-absorbing.

17. The filter element of claim 16 wherein the oil-absorbing second oleophilic polymeric material is a thermoplastic elastomer.

18. The filter element of claim 17 wherein the thermoplastic elastomer of second oleophilic polymeric material is a styrenic mid-block copolymer.

19. The filter element of claim 18 wherein the styrenic mid-block copolymer of the second oleophilic polymeric material is selected from the group consisting of styrene-

ethylene/butylene-styrene (SEBS), styrene-ethylene/propylene-styrene (SEPS), styrene-butadiene-styrene (SBS), styrene-isoprene-styrene (SIS), and combinations thereof.

20. The filter element of claim 16 wherein the oil-absorbing second oleophilic polymeric material is a copolymer of styrene and one or more of pentadiene, cyclopentadiene, butadiene, butylene, propylene, ethylene, and isoprene.

21. The filter element of claim 15 wherein the second oleophilic polymeric material is oil-adsorbing.

22. The filter element of claim 21 wherein the oil-adsorbing second oleophilic polymeric material is a polyolefin.

23. The filter element of claim 1 wherein the first medium further comprises an oil-sorbing filler dispersed in the consolidated mass of the first oleophilic polymeric material.

24. The filter element of claim 10 wherein the filler is an activated carbon.

25. The filter element of claim 15 wherein:

the first stage is formed into a generally cylindrical shape; and

the fill of the second stage radially surrounds the consolidated mass of the first stage.

26. The filter element of claim 15 wherein the first stage is formed into a generally cylindrical shape which radially surrounds the fill of the second stage.

27. A method of removing oil from a flow of an aqueous phase comprising the steps of:

(a) providing an oil-sorbing filter element including a first stage, the first stage being formed of a first medium comprising a consolidated, permeable mass of a first oleophilic polymeric material; and

(b) passing the flow through the first stage of the filter element, the first medium of the first stage sorbing at least a portion of any oil in the flow.

28. The method of claim 27 wherein the consolidated mass of the first medium has a density of between about 0.2-0.8 g/cm^3.

29. The method of claim 27 wherein the first oleophilic polymeric material is oil-absorbing.

30. The method of claim 29 wherein the oil-absorbing first oleophilic polymeric material is a thermoplastic elastomer.

31. The method of claim 30 wherein the thermoplastic elastomer of first oleophilic polymeric material is a styrenic mid-block copolymer.

32. The method of claim 31 wherein the styrenic mid-block copolymer of the first oleophilic polymeric material is selected from the group consisting of styrene-ethylene/butylene-styrene (SEBS), styrene-ethylene/propylene-styrene (SEPS), styrene-butadiene-styrene (SBS), styrene-isoprene-styrene (SIS), and combinations thereof.

33. The method of claim 29 wherein the oil-absorbing first oleophilic polymeric material is a copolymer of styrene and one or more of pentadiene, cyclopentadiene, butadiene, butylene, propylene, ethylene, and isoprene.

34. The method of claim 27 wherein the first oleophilic polymeric material is oil-adsorbing.

35. The method of claim 34 wherein the oil-adsorbing first oleophilic polymeric material is a polyolefin.

36. The method of claim 27 wherein the first medium further comprises an oil-sorbing filler dispersed in the consolidated mass of the first oleophilic polymeric material.

37. The method of claim 36 wherein the filler is an activated carbon.

38. The method of claim 27 wherein:
the first stage is formed into a generally cylindrical shape; and
the flow is passed in step (b) radially through the first stage.

39. The method of claim 38 wherein the cylindrical shape of the first stage is generally annular.

40. The method of claim 27 wherein the filter element provided in step (a) further includes a second stage adjoining the first stage, the flow being passed in step (b) additionally through the second stage of the filter element, the second stage sorbing at least a portion of any oil in the flow.

41. The method of claim 40 wherein the second stage is formed of a second medium comprising a fill of a second oleophilic polymeric material.

42. The method of claim 41 wherein the second oleophilic polymeric material is oil-absorbing.

43. The method of claim 42 wherein the oil-absorbing second oleophilic polymeric material is a thermoplastic elastomer.

44. The method of claim 43 wherein the thermoplastic elastomer of second oleophilic polymeric material is a styrenic mid-block copolymer.

45. The method of claim 44 wherein the styrenic mid-block copolymer of the second oleophilic polymeric material is selected from the group consisting of styrene-ethylene/butylene-styrene (SEBS), styrene-ethylene/propylene-styrene (SEPS), styrene-butadiene-styrene (SBS), styrene-isoprene-styrene (SIS), and combinations thereof.

46. The method of claim 42 wherein the oil-absorbing second oleophilic polymeric material is a copolymer of styrene and one or more of pentadiene, cyclopentadiene, butadiene, butylene, propylene, ethylene, and isoprene.

47. The method of claim 41 wherein the second oleophilic polymeric material is oil-adsorbing.

48. The method of claim 47 wherein the oil-adsorbing second oleophilic polymeric material is a polyolefin.

49. The method of claim 41 wherein the flow is passed in step (b) through the second stage of the filter element prior to being passed through the first stage.

50. The method of claim 41 wherein:

the first stage is formed into a generally cylindrical shape; and

the fill of the second stage radially surrounds the consolidated mass of the first stage.

51. The method of claim 41 wherein the first stage is formed into a generally cylindrical shape which radially surrounds the fill of the second stage.

52. The method of claim 27 wherein the filter element provided in step (a) is received within a housing, the housing being connected in fluid communication with the flow.